

Prevention of diabetic ketoacidosis in children and youth

Key elements from the CDA 2008 Clinical Practice Guidelines*

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DKA can be prevented!

STAT action is required to prevent DKA and save a child's life:

Symptom recognition
polyuria, polydipsia,
nocturia, weight loss

Test blood/urine
for glucose now
(blood glucose meter or
urinalysis in the office or
same day lab test)

Arrange referral
to a pediatric diabetes
specialist

Treat
with insulin today!

39% of children and youth with new onset diabetes who present in DKA have seen a physician in the preceding week.^{1,2} **This encounter represents a missed opportunity for earlier diagnosis and prevention of DKA!**

Diabetic ketoacidosis (DKA) is the leading cause of death and permanent disability in children and youth with new onset diabetes

If you recognize the early symptoms of diabetes in a child or youth, **STAT** action can prevent life-threatening diabetic ketoacidosis.

WHY is prevention of DKA so important?

- Life-threatening cerebral edema occurs in up to 3% of episodes of DKA in childhood, resulting in significant morbidity (up to 35%) and mortality (24%)¹. Because the cause of cerebral edema isn't known, it can only be prevented by avoiding DKA.
- DKA is always preceded by hyperglycemic-related symptoms which have been misinterpreted or misdiagnosed by caregivers or healthcare providers. This represents a missed opportunity for earlier diagnosis and prevention of DKA.
- DKA can be prevented by identifying hyperglycemia-related symptoms and starting insulin before DKA develops.

WHO is at risk of DKA?

- DKA occurs in 15 – 29% of children and youth with new onset diabetes^{2,3}.
- Preschool children are at highest risk of DKA but it occurs in all age groups:
 - 40% of children <3 years of age present in DKA, compared to 19% of 7 – 10 year olds and 12% of 15 – 18 year olds⁴.
 - Diabetes is increasing in children <3 years of age, the group at highest risk of DKA. Their presenting symptoms may be atypical, leading to other diagnoses (e.g. UTI, URTI, diarrhea/gastroenteritis, otitis media)³.
- DKA is more common in children and youth with type 1 diabetes – however, 10% of youth with type 2 diabetes present in DKA².
- Overweight children can develop type 1 diabetes, as can children of all ages and ethnic backgrounds.



* The Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada can be found at www.diabetes.ca/2008cpgs.



Early symptoms of diabetes include:

- Increased urination
- Bedwetting in a previously toilet-trained child
- Increased thirst
- Weight loss
- Fatigue

In individuals for whom type 1 diabetes is a possibility:

to avoid rapid deterioration and development of DKA, confirmatory testing should not delay initiation of treatment with insulin⁵.

HOW can we prevent DKA?

By educating parents and caregivers that:

The early warning signs of diabetes in a child or youth are increased urination, bedwetting in a previously toilet-trained child, increased thirst and fatigue.

By remembering that:

90% of children and youth who develop type 1 diabetes do **not** have a family history of type 1 diabetes.

By recognizing that:

If a child or youth has hyperglycemic-related symptoms, any amount of glycosuria or elevation of blood glucose (BG) requires immediate same day assessment for diabetes – **do not delay referral or initiation of treatment** while waiting for a **repeat BG**.

CDA 2008 Clinical Practice Guidelines chapters of interest

- Type 1 Diabetes in Children and Adolescents (page S150)
 - Figure 1: Immediate assessment and management of DKA in children
- Type 2 Diabetes in Children and Adolescents (page S162)
- Definition, Classification, and Diagnosis of Diabetes and Other Dysglycemic Categories (page S10)

Additional resources to support parents and caregivers of children with type 1 diabetes can be found at www.diabetes.ca.

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References:

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2. Rewers A, Klingensmith G, Davis C, et al. Presence of Diabetic Ketoacidosis at Diagnosis of Diabetes Mellitus in Youth: The Search for Diabetes in Youth Study. *Pediatrics*. 2008;121:e1258-e1266.
3. Mallare JT, Cordice CC, Ryan BA, et al: Identifying risk factors for the development of diabetic ketoacidosis in new onset type 1 diabetes mellitus. *Clin Pediatr (Phila)*. 2003;42:591-597.
4. Bui H, To T, Stein R, Fung K, Daneman D: Is diabetic ketoacidosis at disease onset a result of missed diagnosis? *J Pediatr*. 2010;156:472-477.
5. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. *Can J Diabetes*. 2008;32 (suppl 1):S150-S161.

Across the country, the Canadian Diabetes Association is leading the fight against diabetes by helping people with diabetes live healthy lives while we work to find a cure. We are supported in our efforts by a community-based network of volunteers, members, employees, healthcare professionals, researchers and partners. By providing education and services, advocating on behalf of people with diabetes, supporting research and translating research into practical applications – we are delivering on our mission.